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idea and application touching the development of the theory that he had espoused, with the purpose of presenting at last a complete and convincing array of the evidences of the spreading adoption of the methods of metrophotography and phototopography and of the superiority of the results that have been achieved. The first part of this second volume, which in itself is a book of 184 pages, accompanied by 15 plates, is devoted to the theory of perspective and iconometry and of the camera lucida and the camera obscura, to the description and use of the instruments and apparatus employed in metrophotography and photography, and to the methods of utilizing photographic views in the preparation of maps and drawings. The treatment of the subject is made quite complete by including in the discussion not only these methods and instruments that are at present adopted for practical use, but also those that have been proposed and those that have been tried and set aside, and by exhibiting among the results the attainments in telemetrography by the military observatories during the siege of Paris by the Germans.

The second part, containing 271 pages and 18 plates, is devoted to an exposition of the development and progress of metrophotography in France, Germany, Italy, Austria, Canada, Switzerland, Spain, Russia, and Great Britain, by holding up to view the most characteristic original works in the languages of these various countries, and by pointing out the application of the principles which they recite, not only to topography but also to the sciences and the arts which have borrowed the assistance of photography and often derived unexpected advantages from it. G. W. L.

The Projection for the Map of the British Isles on a scale of 1/1,000,000, by Major C. F. Close, C.M.G., R.E. Published under the direction of Colonel D. A. Johnston, R.E., Director General of the Ordnance Survey. London: Printed for H. M. Stationery Office by Darling & Son, 1903.

Major Close's paper is the outgrowth of the advocacy on the part of the Sixth International Geographical Congress, assembled at London in 1895, of a map of the world on a scale of 1/1,000,000. In carrying out the portion of this project relating to Great Britain and Ireland, the British Ordnance Office found that the projections upon which the present Ordnance maps were constructed are such that the map to be produced could not be made by simple reduction from the existing ones, and, therefore, that such a projection might be adopted in the new construction as would be best suited

to the preparation of the map recommended by the resolution of the Congress. It was decided that the most convenient arrangement of the map would be effected by plotting the United Kingdom on one projection, in two sheets, so arranged that it would be possible to issue, in addition to a single sheet embracing the whole extent of the British Isles, separate maps of England and Wales and of Scotland and Ireland.

The decision to make one engraving serve at the same time for a general map and also for separate maps of the different parts of the country made it necessary to choose some form of projection in which the parallels of latitude are everywhere similar along any parallel; and the conical projection, in which the parallels are represented by concentric circles and the meridians by their radii, was accordingly adopted.

The three forms of conical projection, which were available for adoption, and which are discussed in the paper, are the conical projection with rectified meridians and the standard parallels, Lambert's orthomorphic conical projection, and Albers' equivalent conical projection. The last-named projection was eliminated from the discussion on the ground that, for the purpose of a map intended for general use rather than for statistical purposes, there was no reason for preserving the equivalence of areas at the expense of accuracy in measurements of length and direction.

As regards the other two, the first may be defined as a projection in which the meridians are the radii of the parallels, the angles between the meridians bear a constant ratio to the real differences of longitude, the parallels—two of which are of their true lengths—are concentric circles at their true rectified distances apart; and the second as a projection in which the meridians are the radii of the parallels, the angles between the meridians bear a constant ratio to the real differences of longitude, and the parallels—two of which are of their true lengths—are concentric circles at distances apart based on a convention and not strictly in accord with their true distances on the terrestrial sphere.

Major Close found that each of these projections could be constructed to embrace the United Kingdom and to extend from latitude 50° to 61° north of the Equator, with a maximum error of scale of about $1/400$, and that the first would have the advantage of no error in scale in the north and south direction and the second the advantage of no local error in azimuth. The errors in scale in the east and west direction are practically the same in each case; and the areas are misrepresented in each, but the areal error in

the first or rectified conical projection is about half that of the second or orthomorphic projection. In view of this superiority in the more correct representation of areas, and of the fact that the British Isles are far longer in a north and south than in an east and west direction, the rectified conical projection with two standard parallels was chosen and submitted to a detailed discussion, under formulæ which are clearly presented in the paper with an elegant simplicity, resulting in setting forth that the British contribution to the map of the world on a scale of 1/1,000,000 will be subject in linear and areal measurements to an error no greater than one part in four hundred and thirty-three, and in directional measurements to an error no greater than eight minutes of arc.

The author has chosen for the name of the adopted projection The Minimum Error Rectified Conical Projection with two Standard Parallels.

W. G. L.

Guido Rey. Il Monte Cervino. Illustrazioni di Edoardo Rubino, Prefazione di Edmondo de Amicis, Nota Geologica di Vittorio Novarese, 14 Tavole Colorate, 23 Disegni a Penna e Undici Fotografie. Ulrico Hoepli Editore-Libraio della Real Casa, Milano, 1904. 8vo. (Price, 25 lire.)

Mr. de Amicis thinks that to many persons a mountain will seem to be too small a subject for a big volume; but he advises them to read before they condemn. Every mountain is an interesting subject, and the Matterhorn has peculiar claims upon the reader.

The modern story of the great mountain begins with H. B. de Saussure, who devoted so many years to the study of the Alps. After the publication of his book (*Voyages dans les Alpes*, 4 vols., 1780-1796) tourists began to find their way into Switzerland, and in 1838 Murray brought out the first *Handbook* of that country. In those days travellers had to put up with strange fare and poor accommodations. There was a change for the better about 1860, when Mr. Rey finds in the Visitors' Book at Valtournanche the names of Bonney, Tyndall, Craufurd Grove, Leslie Stephen, Freshfield, and Mummery. An entry under the 27th of August, 1861, reads:

Edward Whymper en route for the Matterhorn.

Mr. Whymper had yet to encounter many defeats before his triumph on the 14th of July, 1865, when he and his guide Croz stood at last on the top of the "inaccessible" mountain.

Mr. Rey writes of Whymper with sympathy and admiration, and